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EXAMINER

SHRIVASTAV, BRIJ B

ART UNIT PAPER NUMBER

2859

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/068,300

Applicant(s)

REISKER ET AL.

Examiner

Brij B Shrivastav

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 18-36,46-60 and 62-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-21,25,27-33,35,36,46-60 and 62-81 is/are rejected.
- 7) ☒ Claim(s) 22-24,26 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

1. Response to the restriction and election requirement has been received and entered. Examiner disagrees with applicant's assertion to combine claims of species 3 with the claims of species 1 for examination on their merits. Applicant has withdrawn claims 37-44 and 82-90 belonging to a separate invention, and nonelected species claims 45, 61, and 91-93. Therefore, in this Office action only claims 18-36, 46-60, 62-81 of the elected species 1 will be examined on their merits.

### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 46-60, 62-76 and 77-81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In each of these claims, use of the phrase – “conductive member(s)” – makes these claims indefinite. Applicant is required to be more specific about the nature of the conductive member(s).

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(a) Claims 62-65, 67, 70, and 72-76 are rejected under 35 U.S.C. 102(b) as being anticipated by Srinivasan et al (US 5,602,497)

As regards to claim 62, Srinivasan et al teach a coil for use with a magnetic resonance system, including a first end having a first diameter and a second end having a second diameter, which is different from the first diameter of the coil (figure 2, numerals 40 and 84). The coil has a plurality of electrically conductive rods extending between the first and the second ends, and each of the rods having a linear portion connected to the first end, and the tapered portion connected to the second end to inherently provide the coil with a substantially homogeneous pattern of magnetic flux density in at least one of three orthogonal imaging planes (figure 2, numerals 40, 82 and 84).

As regards to claims 63-65, 67, 70, and 72-76, Srinivasan et al teach a versatile conductive/reactive rings birdcage coil with same or different diameter ends connected by conductive/reactive rods.

(b) Claims 32, 33, 35, 36, 77, 78, 80 and 81 are rejected under 35 U.S.C. 102(e) as being anticipated by Yeung (US 6,100,691)

As regards to claim 32, Yeung teaches a coil for use with a magnetic resonance imaging system to form images of a region of interest during scanning procedure, including an electrically conducting ring at one end of the coil having a diameter and a second electrically conducting ring at the second end having a second diameter

(figures 2a, 3a, numerals 20, 22, 30, 32). The coil has a plurality of electrically conductive rods extending between the first and the second ends, so that each of the electrically conductive rods, at each end thereof having a tapered portion, said tapered portions being selected to maximize homogeneity of magnetic flux density in said coil (figures 2a, 3a; numerals 24, 26).

As regards to claim 77, Yeung teaches a coil for use with a magnetic resonance system, including a first end having a first diameter and a second end having a second diameter (figures 2a, 3a; numerals 20, 22, 30, 32). The coil has a plurality of electrically conductive rods extending between the first and the second ends, so that each of the electrically conductive rods, at each end thereof having a tapered portion, said tapered portions being selected to maximize homogeneity of magnetic flux density in said coil (figures 2a, 3a; numerals 24, 26).

As regards to claims 33, 35, 36, 78, 80 and 81, Yeung teaches a birdcage coil, having first and second equal diameter rings, and also the coil having the two end diameters are smaller than the center diameter of the coil (figures 1 and 2a)

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-21, 25, 27-31, 46-49, 51-54, and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srinivasan et al (5,602,479), and further in view of Adriany et al; Proceedings of the International Society for Magnetic Resonance in Medicine, page 177, April 12-18, 1997.

As regards to claim 18, Srinivasan et al teach a coil for use with a magnetic resonance imaging system to form images of a region of interest during scanning procedure (figure 1). The coil has first electrically conductive ring at its one end having a first diameter (figures 1 and 2, numerals 40), and a plurality of rods in electrical communication with the first ring (figure 2, numerals 82). Each of the rods has a linear portion and a tapered portion, wherein the linear portion is connected to the first ring (figure 2, numerals 40, 82). Srinivasan et al do not specifically teach a second ring having a second diameter, which is different from the first diameter of the first ring (instead teach a circular electrode having a different diameter than the diameter of the first ring, and the circular electrode is connected to the tapered end portions of the rods, see figure 2, numeral 84). Adriany et al teach a second ring having a second diameter, which is different from the first diameter of the first ring of the coil (made of two coils, the two ends of the coil are connected by separate conductive linear and tapered overlapping rods for the system to work as one coil unit efficiently after proper adjustment; figure 1, column 2, paragraph 2, lines 1-6). It would have been obvious to one of ordinary skill in the art to adapt the second conductive ring having second diameter of Adriany et al, which is electrically connected to the end of the tapered conductive rods (see coil 2, as shown in figure 1) in place of the circular electrode of

Srinivasan et al (figure 2, numeral 84) to avoid adjustment of overlap between the two coils of the coil of Adriany et al, which is critical for proper functioning of the coil for improving image quality.

As regards to claim 46, Srinivasan et al teach a coil for use with a magnetic resonance system, including a plurality of electrically conductive members each having a linear portion and a tapered portion (figures 1 and 2, numerals 82), and the electrically conductive members are arranged to form a first opening having a first diameter (figure 2, numeral 40), inherently providing the coil with a substantially homogeneous pattern of magnetic flux density in at least one of three orthogonal imaging planes of said coil (column 2, lines 25-54). Srinivasan et al do not specifically teach an electrically conductive second opening of the coil having second diameter (instead teach a circular electrode having a second diameter, which is different from the first diameter of the first opening. Adriany et al teach an electrically conductive second opening of a coil having second diameter (made of two coils, having two different diameter circular end openings, figure 1, column 2, paragraph 2, lines 1-6). It would have been obvious to one of ordinary skill in the art to adapt the second opening of the coil of Adriany et al (see coil 2, as shown in figure 1) in place of the circular electrode of the coil of Srinivasan et al (figure 2, numeral 84) to avoid adjustment of overlap between the two coils of the coil of Adriany et al, which is critical for proper functioning of the coil for improved image quality.

As regards to claims 19, 21, 27-31, 47, 49, 51-53, and 56-60 Srinivasan et al teach a versatile birdcage coil with reactive elements as a transmitter receiver birdcage coil with different diameter first and second end rings (figure 1, 2, 6)

As regards to claims 20, 25, 48 and 54, Srinivasan et al do not teach two circular coils with different diameters. Adriany et al teach two circular coils with different diameters. It would have been obvious to one of ordinary skill in the art to adapt Adriany et al's teachings with the teachings of Srinivasan et al to create a coil with improved homogeneity of the created magnetic field to improve image quality.

#### ***Objected Claims***

5. Claims 22-24, 26, 34 are objected to as being dependent upon a rejected base claim(s), but would be allowable if rewritten in independent form including all of the limitations of the base claim(s) and any intervening claims.

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

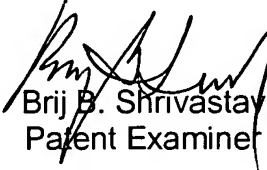


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 703-305-0649. The examiner can normally be reached on 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on 703-308-3875. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0956.

Bbs  
December 15, 2003

  
Brij B. Shrivastav  
Patent Examiner